layer 3 existing therebetween. These first and second magnetic layers 1 and 2 are not antiferromagnetically coupled to each other, but form a non-coupled, laminated magnetic film.

The first and second magnetic layers 1 and 2 may be made of a Co-containing ferromagnetic material of, for example, simple Co or a Co alloy. The magnetic layers 1 and 2 may also be made of an NiFe alloy or the like. Of those materials, especially preferred is a Co alloy as being able to enlarge both the bulk effect and the interfacial effect, whereby the MR ratio in the MR device could be enlarged.

The Co alloy for constituting the magnetic layers 1 and 2 includes Co-based alloys containing at least one or more elements selected from Fe, Ni, Au, Ag, Cu, Pd, Pt, Ir, Rh, Ru, Os, Hf, etc. It is desirable that the additive element content of the alloys falls between 5 and 50 at.%, more preferably between 8 and 20 at.%. This is because, if the additive element content is too small, the bulk effect of the alloys will be poor; but, on the contrary, if the additive element content is too large, the interfacial effect of the alloys will lower. Of the additive elements, especially preferred is Fe, as giving large MR ratio.

Of the first and second magnetic layers 1 and 2, the lower first magnetic layer 1 is formed on a magnetoresistance effect-improving layer (MR-improving layer) 4. The MR-improving layer 4 is formed on a nonmagnetic layer having a

subbing function (hereinafter referred to as nonmagnetic underlayer) 5. The nonmagnetic underlayer 5 is, for example, a layer containing at least one element selected from Ta, Ti, Zr, W, Cr, Nb, Mo, Hf and Al, for which are used any of simple metals or alloys of those metals, or compounds such as oxides or nitrides of those metals. Where the nonmagnetic underlayer 5 is of an oxide of Ta or the like, electrons that could not be reflected on the MR-improving layer 4 could be reflected on the interface of nonmagnetic underlayer 5/MR-improving layer 4, as will be described in detail hereunder.

The first magnetic layer 1 is a free layer of which the magnetization direction varies depending an applied magnetic field. On the second magnetic layer 2, formed is an antiferromagnetic layer 6 of any of IrMn, NiMn, PtMn, FeMn, RuRhMn, PdPtMn or the like. From the antiferromagnetic layer 6, a bias magnetic field is applied to the second magnetic layer 2, by which the magnetization of the layer 2 is pinned. Accordingly, the second magnetic layer 2 is a pinned magnetic layer.

Apart from the method of pinning the second magnetic layer noted above in which the second magnetic layer is directly contacted with the antiferromagnetic layer for thereby pinning its magnetization direction, a so-called Synthetic antiferromagnetic structure may also be employed for the intended pinning, though not shown in Fig. 32. Briefly, a

third magnetic layer is laminated on the second magnetic layer via a layer of Ru, Cr or the like, and the second magnetic layer and the third magnetic layer are antiferromagnetically coupled to each other in a manner of RKKY. Using the Synthetic antiferromagnetic structure is preferred, as the bias point is stabilized and the stability of the pinning characteristic at high temperatures is enhanced. Concretely, examples of the structure comprising the second magnetic layer and the third magnetic layer include CoFe/Ru/CoFe, Co/Ru/Co, CoFe/Cr/CoFe, Co/Cr/Co, etc. The antiferromagnetic layers to be applied to the Synthetic antiferromagnetic structure may be the same as those mentioned above.

Examples of the material that constitutes the nonmagnetic layer 3 to be disposed between the first and second magnetic layers 1 and 2 include Cu, Au, Ag and their alloys; paramagnetic alloys comprising any of these metals and magnetic elements; and Pd, Pt and alloys consisting essentially of these.

On the antiferromagnetic layer 6, formed is a protective layer 7. The protective layer 7 may be made of metals or alloys which are the same as those for the nonmagnetic underlayer 5. These constituent layers form the spin valve film 8 of this embodiment. A pair of electrodes (not shown) for supplying sense current are connected to the spin valve film 8 to construct a spin valve GMR device. The spin valve GMR device